



Video Abstract

The use of exoscope combined with tubular retractor system for minimally invasive transsulcal resection of an ventricular atrium atypical choroid plexus papilloma: Three-dimensional operative video

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ABSTRACT

Background: Choroid plexus papilloma represents 1–4% of pediatric brain tumors, mostly located in the ventricular atrium.^[1] Intraventricular tumors represent a challenge due to the poor visualization of the surgical field and damage to surrounding structures.^[2] Use of tubular retraction reduces cerebrovascular trauma to the surrounding parenchyma by distributing pressure uniformly, allowing less invasive corticotomy, and more stability on surgical corridors that allow the surgeon to use both hands and external visualization devices.^[2-5]

Case Description: We present the case of a 3-year-old boy with progressive headache, vomiting, and loss of control in the left hand for 3 months, with a history of ventricular shunt placement for acute obstructive hydrocephalus. The MRI revealed large lobulated lesion, which was hypointense on T1, hyperintense on T2, marked enhancement on T1 C+ (Gd) within the atrium of the right lateral ventricle, and spectroscopy with a peak of choline. Written consent for the use of photos and videos on this work was obtained from the patient's mother. A high-definition two-dimensional exoscope (VITOM® Karl Storz, Tuttlingen) was used during the surgical approach and throughout tumor removal, which was aided by ViewSite Brain Access System (VBAS®; Vycor Medical Inc.).^[3] We performed a transparietal minimally invasive transsulcal parafascicular approach through the Frazier point for direct access to the ventricular atrium. Histological examination confirmed atypical choroid plexus papilloma. Postoperative imaging shows no residual tumor. The postoperative course was satisfactory with improvement of the headache and control of the left hand, leading to discharge home 1 week after surgery.

Conclusion: The tubular transparietal minimally invasive approach obviates the need for traditional approaches to the atrium. This technique is safe and effective for the treatment of intraventricular and periventricular lesions, thus making this challenging target in more accessible to neurosurgeons, avoiding structure damage and any associated morbidity or mortality.

Keywords: Atypical papilloma, Exoscope, Tubular retraction, Ventricular atrium

[Video 1]-Available on:

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Annotations^[1-5]

- 1) 00:00 – Introduction and Case presentation
- 2) 01:02 – Differential diagnosis
- 3) 01:08 – Rationale for the procedure
- 4) 01:46 – Risks of the procedure and its potential benefits
- 5) 01:53 – Alternatives and why they were not chosen
- 6) 02:06 – Positioning
- 7) 02:18 – Necessary equipment
- 8) 02:37 – Key Surgical Steps
- 9) 06:00 – Disease background
- 10) 06:30 – Postoperative MRI and outcome.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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